REMARKS

Claims 1-20 are pending in the application.

Section 102(b) Rejections

Claims 1-6 and 9-20 were rejected in paragraph 1 of the Office Action under 35 U.S.C. § 102(b), as anticipated by Jackson, (NASA Technical Memorandum 110164, dated April 1995). These rejections are respectfully traversed.

It is respectfully submitted that Jackson does not teach the use or application of a causal network model as expressly required by the independent claims of the present application. Jackson describes the LaRCsim software package:

> LaRCsim is a set of C routines that implement a full set of equations of motion for a rigid body aircraft in atmospheric and low-earth orbital flight. It is intended to be used with additional, user provided subroutines (either FORTRAN or C) that describe the aerodynamics, propulsion system, and other flight dynamic elements of a specific air vehicle. Once combined with vehicle-specific routines, LaRCsim provides a desktop- and/or cockpit-based near real-time simulation of the vehicle for engineering analysis and control law development. (Page 1, last paragraph, running onto page 2).

There is no mention of a "causal network model" anywhere within Jackson. Instead, Jackson describes a set of C software routines that are combined with other user provided subroutines which are compiled together with the LaRCsim software and then executed utilizing parameters established in a default settings file. (Pages 3-8). The sequence of how the various subroutines are executed is dictated by the main() routine for the LaRCsim software as described in the Theory of Operation (Pages 21-23). The end result of running the LaRCsim software program is to permit a pilot-in-the-loop the user control and attempt to land the simulated aircraft

using a mouse and keyboard to simulate moving a control stick for the aircraft. (Page 8 – GL console operation).

In many ways, Jackson actually demonstrates some of the design problems that are overcome by the present invention. Because there is no causal network model defining a dynamic interrelationship among an integrated collection of analysis models in Jackson, changes to the software of Jackson, other than a change to an initial parameter setting file, would require a computer programmer to go in and change the coding for an individual subroutine. In doing so, that computer programmer has to already know, understand and account for all of the intricacies and interrelationships that may be involved between the subroutine being modified and the rest of the software modules. The conventional software subroutine approach taught by Jackson does not teach or suggest anything like the use of a causal network model as taught and claimed by the present invention.

In contrast, Applicants' invention teaches and claims the use of a causal network model to evaluate multiple virtual and dynamic models. The causal network model provides for a database representation of the cause-and-effect relationship among the various analysis models of the components of a given weapon system. In the present invention, the causal network model creates "a virtual representation of the weapon system" that is then used by the simulation system, as claimed in claim 1, to simulate the weapon system.

Because Jackson does not show "a causal network model," and because Jackson does not utilize a causal network model to create "a virtual representation of a weapon system," a *prima facie* case of anticipation has not been established.

With respect to dependent claim 2, it is respectfully submitted there is no teaching in Jackson describing anything like the claimed "effectiveness simulator." The reference to the

entire document as support for this element does not meet the burden of proving a *prima facie* case of anticipation.

With respect to dependent claims 3 and 4, it is respectfully submitted that the citation for the control system (page 1, paragraph 6) does not describe the claimed limitations. The fact that Jackson may be useable with different terminals, user interfaces or output options, does not disclose a control system that permits the underlying code to be run in one of a plurality of modes of operation.

With respect to dependent claim 5, it is respectfully submitted that, again, there is nothing in Jackson that teaches or describes a sensitivity analysis.

With respect to dependent claim 6, it is respectfully submitted that the reference to the trim algorithm in Jackson is not a reference to an optimization routine, but it rather a reference to the trim operation for flight control. Specifically, Jackson teaches that there is no "optimization routine" because "The current mechanism to specify (and modify) the trim method requires editing the default settings file, or specifying a setting file containing a different set of trim controls and outputs by use of the –I flag on the command line." (Page 9, paragraph 2).

With respect to dependent claim 10, it is clear that there is no display of a diagram of a causal network model because no such graph is shown or referenced at the location cited in the Office Action.

With respect to dependent claim 12, again, the citation to the reference does not support any teaching of a "series of data arrays."

With regard to dependent claim 14, as previously discussed, there is simply nothing in Jackson that teaches or suggests the claimed relational database.

Section 103 Rejections

Dependent claims 7 and 8 were rejected in paragraphs 4 and 5 of the Office Action under 35 U.S.C. § 103(a), as being obvious over Jackson in view of Allred (Allred, L. G., *Aerospace and Electronics Conference*, 1990, NAECON 1990, Proceedings of the IEEE 1990 National, 21-25 May 1990, Pages 359-361 Vol. 1). These rejections are respectfully traversed for the reasons set forth above, as well as for the following reasons.

It is respectfully submitted that a *prima facie* case of obviousness has not been established. Specifically, because there is no teaching or suggestion of any kind of an optimization routine, as required by dependent claim 6, there is no motivation established to modify Jackson in the light of the teachings of Allred as suggested in the Office Action. Because Allred teaches the solution of a ***particular*** system of equations, unless the software subroutines of Jackson can be exactly represented and manipulated in the manner described in Allred, Jackson cannot be combined with Allred.

In view of the foregoing, it is submitted that this application is in condition for allowance. Favorable consideration and prompt allowance of the application are respectfully requested.

The Examiner is invited to telephone the undersigned if the Examiner believes it would be useful to advance prosecution.

Respectfully submitted,

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